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THE GENUS DRAECULACEPHALA AND ITS ALLIES IN NORTH AMERICA (RHYNCHOTA HOMOPTERA)

E. D. BALL

The writer in working over his recent additions in this group by Van Duzee's excellent key found that he had all the species recorded and material in four apparently undescribed forms. A careful study of the specific relationships indicated that there were two distinct groups involved and these have been separated. Mr. J. A. Reeves made numerous dissections and mounts of internal genitalia, and while he found an exceedingly complicated and somewhat variable structure, in only one case was there sufficient variation to be diagnostic. Such widely separated and even generically distinct species as *mollipes* and *reticulata* had internal genitalia of the same pattern. It was also noted that none of the previous drawings of these structures presented any adequate idea of their complexity. The members of both genera are easily separated from all related forms by the retculate venation of the apical half of the elytra.

A. Vertex flat, or nearly so, with a definite edge; face nearly straight in profile, front with about 9 narrow parallel lines on each side the disc. .....Genus—*Draeculacephala* Ball

AA. Vertex and front conically produced the margins rounding; face inflated in profile. Front mottled, without lines or rarely with interrupted lines. .....Genus—*Carneocephala* Nov.

GENUS DRAECULACEPHALA BALL

The members of this genus are all green or straw colored with pale or smoky faces, in the pale forms the parallel arcs are black. In the black faces of some of the males they may appear as just visible light lines or almost wanting. The species of this genus are relatively slender and range from 6 to 11 mm. in length. The vertex is quite variable in length in a given species, and still more so in the different species. The male vertex is usually much shorter and more highly ornamented than the female.

KEY TO THE N. A. SPECIES

A. Vertex triangular acute, disc flat, the margins straight or concave; face often dark.

B. Vertex and scutellum without paired black spots. Vertex without broad black markings or a black apex, male front often black.

C. Large, 8-11 mm.

D. Extremely large, 10 mm. or over, with last segment in the male tubular—the plates extremely long.

E. Clypeus definitely angulate in profile, face straight; pale. —(North) 1. *angulifera* Walk.

EE. Clypeus and face in an almost uniform curve in profile, front almost black in male.....(Florida) 2. *portola* n. sp.

DD. Male smaller 9 mm. or less—male segment triangular, plates triangular.

F. Clypeus and lorae inflated, wider than front. Front with a black dash at apex; vertex and anterior margin of pronotum heavily marked; elytral nervures metallic blue in life. .....(S. E.) 3. *producta* Walk.

FF. Clypeus and lorae normal, front unmarked, vertex and anterior margin of pronotum straw yellow scarcely marked. .....(North & N. E.) 4. *mollipes* Say

CC. Smaller, female 7.5 mm. or less.

G. Stout vertex and pronotum equal in female. Front and vertex, in female, pale, apex not attenuately produced. .....(S. W.) 5. *minerva* n. sp.

GG. Very small, slender; vertex longer than pronotum in female, apex attentuate. Front black in both sexes. —(S. E.) 6. *bradleyi* Van D.

BB. Vertex with a pair of small dots behind ocelli, and a large pair on scutellum often partly concealed by pronotum. Vertex may have a black triangle at apex or broad black stripes in which case the basal spots may be minute; face not black.

H. Two small round spots on disc of scutellum—vertex with a black wedge at apex or broad black markings. Anterior submargin of pronotum vermiculate.

I. Vertex with broad black markings—submargin of pronotum heavily vermiculate. —(S. E.) 7. *inscripta* Van D.

II. Vertex pale with a black or mottled apical wedge —submargin of pronotum obscurely mottled.

J. Face smoky with black arcs; vertex lined in female—male vertex with pagoda marking—under 7 mm. .....(Fla.) 8. *pagoda* n. sp.

JJ. Face and vertex mottled—male vertex mottled on disc. Larger. (Mex. and C. A.) 9. *lenticula* n. sp.

HH. Spots on scutellum widely separated and partly

concealed by pronotum. Two spots on vertex behind ocelli and a third on disc before middle—markings obscure except for the 5 or 7 spots.

K. Small, green, the spots small and occasionally wanting.....(S. E. and Mex.) 10. *balli* Van D.

KK. Larger straw color with a tawny tinge on elytra. Spots large definite, often 7 or more (South) 11. *7-guttata* Walk.

AA. Vertex rounding at apex with the margin thickened anteriorly, often with heavy black markings on vertex but none on pronotum or scutellum. Face never black.

L. Vertex in female longer than pronotum, distance from suture on margin to apex greater than width at that point—males with the apical spots approximate and in heavily marked examples joined to a broad black line on apical third of vertex. —(North) 12. *manitobiana* Ball

LL. Vertex about equalling pronotum in female; breadth across suture much greater than length beyond that point. Males without a broad median line on apical third of vertex.

M. Apical dots of vertex small, approximate; line between eye and suture narrow, often brown. Male antennae enlarged. —(N. W.) 13. *crassicornis* Van D.

MM. Apical dots large and widely separated—line between eyes and suture broad, shining black. Male antennae normal. (North) 14. *novaeboracensis* Fh.

D. angulifera Walk. This extremely large and striking species was taken in numbers in August 1897 from a clump of rushes on the margin of a shallow pond at Ames, Iowa. In all his collecting since that time the writer has not discovered it again. It is probably a relatively rare form, except in the extreme North. Olsen in 1918 records examples from N. Y., N. J., Fla., La., and Tex. Examples of *angulifera* as determined by Olsen that the writer has seen have not been the species mentioned above and figured in the writer's Review of the Tettigonidae. It is likely that the southern forms he mentions were the same as those listed here as *producta* Walk or possibly *portola* described below.

Draeculacephala portola n. sp.

Size and form of *angulifera* nearly with a longer vertex. Straw yellow and deep green above; female front smoky, male black below. Length: female 11 mm., male 8.5 mm.

Vertex long, slender, acutely angular with the margins straight, one-third longer than pronotum in female, about equalling it in male. Face in profile slightly convex, the curve includ-

ing the clypeus which may be slightly protuberant but not angled. Male with last ventral segment long, narrow, tubular; the plates extremely long, acute but not filamentous at the extremity as in *angulifera.*

Color straw yellow, the disc of pronotum and the elytra brilliant green, vertex with the median line, the sutures, the ocelli and the usual pair of lines at apex narrowly black. About 3 faintly dotted arcs on the long roll of the reflexed front, on either side, and a pair of dotted, diverging lines arising in the margin of the roll back of the apex and running inside the ocelli. The reflexed portion is much longer and narrower than in *angulifera* and in that species the divergent lines are heavier and arise in an outward curve on the middle of the disc and behind the roll. Below pale in female, except for a smoky front and a black line below the eyes on either side. Male, all black below the lateral line except the apex of clypeus and sometimes the plates.

Holotype female, allotype male and 3 pairs of paratypes taken by the writer at Fulton, Fla. (Label Jax'ville) May 8-27. They were taken on a sandy ridge that separated the St. Johns River from a tide flat and were all swept from a sparse stand of coarse grass probably a *Spartina.* This location is in sight of St. Johns Bluff. Another pair were taken June 20, '26 in a similar location at Mayport just below the bluff. Walker described *producta* and *acuta* from St. Johns Bluff, but these are much smaller species than this and appear to apply to varieties of the common marsh species mentioned below.

D. producta Walk. This species occurs in shaded marshy areas in Florida and has been found most abundantly, both nymphs and adults, on Water Hyacinth and golden-club *(Orontium aquaticum* L.) growing in the deep shade on the edge of cypress swamps. There is a wide variation in size and length of head, but the writer has not been able to find any constant character that would separate the two forms Walker described, and as *producta* has page preference that name has been used.

Draeculacephala minerva n. sp.

Slightly broader than *balli,* shorter, stouter, with a broader head than *mollipes.* Vertex about equalling the pronotum in the female. Female pale, male black below. Length: female 7 mm.; male 6 mm.

Vertex broad and flat, the margins straight, as long as pronotum, profile of face definitely convex, the clypeus only slightly prominent. Elytra short and relatively broad.

Color: Female; yellow, the vertex frequently orange with a black tip and an oblique line from the green ocelli to the margin in front of eyes. Disc of pronotum and elytra deep green.

Face very pale smoky, below pale. Male greenish yellow with the same markings on vertex. Pronotal disc and elytra deep green. Below black the tibiae frequently pale.

Holotype female and allotype male Stanford, Calif. June 21, '08 (Ball) and four pairs of paratypes from San Jose (King) and Chino Calif. (Ball and Titus). This form was included in *D. mollipes* var. *minor* of the writer's previous review of this group and the *D. minor* of Van Duzee's Key and Catalogue. This however appears to be a distinct species confined to the Southwestern U. S. and Mex. The writer has collected it in St. George in extreme Southern Utah and in many places in Calif. from Chico south and has examples from Ariz. and several places in Mex. south to Vera Cruz. Walker's *D. minor* was from the Atlantic Coast region and examples of a small var. of *mollipes* with black faced males have been taken in the tide flat regions of N. Y. and New Jersey southward. They have longer vertices and lack the oblique line out from the ocelli. This species and *producta* have no doubt been confused with *mollipes* in the past. The material at hand indicates that *minerva* is at home in the arid S. W., *mollipes* in the North and Northeast and *producta* in the Southeast.

D. inscripta Van D. This strikingly marked species came in some numbers to a trap light in a celery field at Sanford, Florida, May 8, 1927. Olsen has already recorded the fact that most of the examples in collections have been taken at lights. A single female was taken at Sanford Oct. 13, '26 from the shore of Lake Jessup just above the line of the Hyacinth on the mud flats.

Draeculacephala pagoda n. sp.

Form of *minerva (minor* of Auth.) but definitely smaller. Allied to *inscripta* in markings on pronotum and scutellum but much paler. Small dusky green with a black wedge at apex of vertex. Length 5.5-7 mm.

Vertex a trifle longer than pronotum in female, about equalling it in male, flat, acute. Face in profile slightly concave above, broadly angled over the exceptionally inflated clypeus. Female segment angularly produced; male plates attenuate.

Color dirty straw with the disc of pronotum and elytra dusky green. Spots on apex of vertex united into a dark brown wedge running back on disc and omitting a tiny ivory apex: Sutures and a pair of divergent lines on disc in female black; a dot on median line in back of wedge, a pair of dots at base, inside and behind ocelli, indistinct vermiculations on the submargin of pronotum and a pair of round spots on disc of scutellum, black. Face smoky above, pale below with a smoky median line expanded on apex of front. Below pale in female slightly dusky in male. Male, with a broad dark pagoda like pattern on vertex made up of four pillars and a sloping roof supporting the wedge as a cupola.

Holotype male and allotype female taken July 16, '26, Sanford, Fla. and two pair of paratypes taken Aug. 18, '27. These were all taken from a small thick mat of grass growing in the deep shade of a swamp forest near Oviedo. This species is about the same size as *balli*, but much stouter and easily distinguished by the black wedge at apex.

Draeculacephala lenticula n. sp.

Resembling *minerva* in size and form but slightly narrower, as narrow as *balli* but with a shorter head. Dirty green with the vertex pale yellow finely irrorate with fuscous; face mottled with pale brown. Length 6-7.5 mm.

Vertex about equalling the pronotum; very similar to *minerva* except that the frontal rolls are higher and the apex broader, thus leaving a rather broad and deep depression between them. Face full, a trifle convex in profile with a very obtuse angle on the clypeus. Pronotum very flat with a submarginal area of irregular depressions. Female segment rather long, truncate with an extremely long and narrow median projection whole segment, including projection, with a sharp median keel. Male segment very wide; valve semicircular; plates narrow attenuate with filamentous upturned tips.

Color: vertex dirty yellow, the ocelli green surrounded by white, suture before the ocelli and a line on margin to the eye together with a pair of widely separated converging apical lines black. In the male the apical lines fuse into a wedge shaped spot. Rest of vertex irregularly irrorate with brown. Anterior margin of pronotum dirty yellow, irregularly irrorate or vermiculate in the depressions; sometimes ocellate spots are formed. Disc of pronotum and elytra rusty green, face mottled with brown; below pale except for the black abdominal sternites in the male.

Holotype female Orizaba, V. C. (Osborn) allotype male La Antiqua, Mex. (Barrett). Paratypes; one male "near Mex. City" (Barrett) four females and a male La Ceiba Honduras (Dyer) U. S. N. M. One male Tegucigalpa Honduras (Dyer) sent as a paratype of Gibsons *soluta* but differing from the type and rest of paratypes.

Type and paratypes in author's collection; paratypes in U. S. N. M.

D. bradleyi Van D. This small deep green species with the black face in both sexes has been taken in abundance, both nymphs and adults, on low flat marshy places in Florida where a beaked rush (Ryncospora) is common. It has been taken less commonly on the little mats of spike rush (Elocharis) on the margins of ponds.

D. balli Van D. (*soluta* Gib.) Through the kindness of Mr. McAtee the writer examined two paratypes of *soluta* Gib. The two examples sent were widely different and represent two distinct species. Mr. Mc-

Atee stated that the type and remaining paratype were like the "long nosed" one which is a typical *balli* except that the seven spots are small. As the name must go with the type, *soluta* Gib. becomes a synonym of *balli*. *D. balli* is apparently widely distributed. The writer has taken it at Jamestown Va. and in Florida and has examples from La., Miss., and many places in Central Mexico, while the *soluta* type, paratype and other examples sent were from Honduras. Many of the Mexican and some of the Honduras specimens lack the spots on scutellum and a few lack all of them. The small size, slender form, and pale face will separate even these from any other species. The Jamestown examples were taken from a mixed salt grass and a "five finger" grass area on the river bank near the monument.

D. crassicornis Van D. The writer has examples of this rare species from Hood River, Oreg. (Titus), Toppenish, Wash. (Davis), Victoria, B. C. (Downes), Uinta Mts., Utah (Pammel), Rico and Pikes Peak, Colo. (Ball). The last three records were from high altitudes and all the records are from regions of high mountains, which may be significant.

Genus Carneocephala nov.

Resembling *Draeculacephala* in general appearance and reticulate apical portion of elytra, but with front inflated and conically rounding over to vertex. Vertex variable in length, but lacking the definite margin of *Draeculacephala* and *Graphocephala*—front strongly inflated, strongly convex in profile, mottled with tawny, and lacking the dark parallel arcs of *Draeculacephala*. Pronotum long and inclined to be octagonal as in *Helochara*. Elytra long, narrow, reticulate veined beyond the clavus.

Type of the genus *Draeculacephala floridana* Ball.

The known species are all pale green with the front, vertex and anterior margin of pronotum some shade of yellow, the front and usually the vertex mottled with some shade of brown or tawny. The smoky or black face and venter so common in *Draeculacephala* is unknown; instead there may be touches of scarlet on the venter as in *Graphocephala*.

KEY TO THE SPECIES

A. Vertex longer than pronotum, acutely conical in both diameters; elytral nervures almost concolorous. Species large —(S. E.) 1. *floridana* Ball.

AA. Vertex shorter or only about equalling the pronotum elytral nervures paler, species small.

B. Vertex very short and blunt; tawny or fulvous without definite dark lines or spots; scutellum without markings; elytra dusky with greenish white nervures in sharp contrast; apex of elytra closely reticulate. .....(South) 2. *reticulata* Sign.

BB. Vertex longer, tawny or rusty irrorate, with definite dark or light markings, or both; elytra with relatively few and obscure reticulations; scutellum ornamented.

C. Dark mark on vertex long, reaching ivory dot at apex; median line dark on basal half: female 6 mm.....(Colo.) 3. *gillettei* Ball.

CC. Dark (or tawny) mark on vertex small set well back of apex and usually surrounded by a white margin. Very small, female 5 mm. or less. (Mexican Border of U. S., Mex. and W. I.). 4. *sagittifera* Uhl.

Carneocephala floridana Ball has been taken by the writer in abundance, both nymphs and adults, on a mixture of Sea Blite *(Salicornia herbacea)* and Salt Wort *(Bates maratima)* growing in profusion on the tide flats along the Atlantic Coast of Florida from Jacksonville south to Miami. Mrs. Slossom took the first examples at Charlotte Harbor on the West coast.

C. gillettei Ball has only been taken sparingly in a few isolated alkaline areas in Colo. Species of *Salicornia* or *Dondia* growing in these areas may be the food plant.

C. sagittifera Uhl has been recorded from Tex. and doubtfully from California by Olsen. The writer has examples from several places in the West Indies, including the type locality (compared with type). He also has examples from three places along the border in Texas, (one recorded as from an alkali area), and has taken it at St. George, Utah sweeping *Atriplex* and *Dondia*. With the exception of *reticulata* which swarms on Bermuda and allied grasses throughout the Southern States and on to California, all the species of this genus seem to be confined to alkaline locations.

EBURIA QUADRIGEMINATA PERFORATES A LEAD PIPE

There are several authentic cases on records of beetles perforating lead pipes but they are so uncommon that such a record is still of value and the above species seems to be a new culprit.

June 22nd the Entomologist of the Experiment Station received from the Telephone Company of Lakeland a specimen of the above beetle and a piece of lead pipe with on oval hole ⅜ of an inch long and ¼ of an inch wide. The wall of the lead pipe was about 3/32 of an inch in thickness.

The circumstances are as follows: Between 25 and 30 telephones in that city ceased working simultaneously. Investigations revealed a hole in the lead pipe which was attached to a pole. The beetle had bored thru the wooden pole to the lead and the hole in the pipe corresponded with this hole in the pole, and in the hole in the pole the beetle of the above species was found. There is thus practically no doubt but that the beetle bored both the hole thru the pole and the opening into the lead pipe.

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J. R. WATSON.....*Editor*
WILMON NEWELL.....*Associate Editor*
A. N. TISSOT.....*Business Manager*

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THE ENGLISH ORCHID THRIPS
Native to Florida

Additions to Thysanoptera of Florida.—XVI

In 1909 (Ent. Monthly Mag. N. S. XX p. 33) Bagnall described *Anaphothrips orchidaceous* from two localities in England and one in Ireland. It was found feeding "on various hothouse orchids, *Odontoglossum, Cypripedium,* and *Zygopetalum*". Its depredations were sufficiently severe to attract the attention of horticulturists and to receive a common name, "The Yellow Orchid Thrips" or the "Yellow Thrips".

In the same year Bagnall recorded (Ann. Soc. Ent. Belg. L. III, P. 171) it from Belgium in the Brussels Botanical Gardens from *Chamaedorea fragrans* and from Scotland (Jl. Econ. Biol. IV, P. 38), and records *Cymbidium* and *Epidendron* as hosts.

C. B. Williams (Jl. Econ. Biol. VI, P. 220) adds a new locality record (Liverpool) and *Miltonia, Oncidium* and *Mormodes* as hosts.

The writer has recently received specimens of this species taken from *Dendrobium clavatum* from England by inspector W. T. Owrey of the Federal Horticultural Board.

During November and December, 1926, Mr. A. N. Tissot collected a quantity of the orchid *Epidendron* from the limbs of live oak trees and placed them in a Berlese funnel. Among other insects a number of specimens of this thrips were taken. The writer has carefully compared them with specimens secured from England and finds them identical. The dark longitudinal band of this handsome insect makes its recognition easy.

This is the first recorded capture of this species outside of Europe. The circumstances of its capture—on native orchids

many miles from any greenhouse in which orchids are grown—points unmistakably to its being a native of Florida. It doubtless occurs in other parts of semitropical and tropical America and has been introduced into European hothouses from some locality in America on imported orchids.—J. R. Watson.

THE THYSANOPTERA FAUNA OF THE INDIAN PIPE

(Continued from Vol. XI, No. 2, P. 30)

KEY TO THE NORTH AMERICAN SPECIES OF ANAPHOTHRIPS

(Including Proscirtothrips Karny)

a. Antennae 9 segmented.
  b. More or less prominent bristles on posterior angles of prothorax *(Proscirtothrips* Karny.)
    c. Head about as long as wide; antennal segment 3 not pedicellate ..... *zeae*, Moulton.
    cc. Head considerably wider than long; antennal segment 3 pedicellate.
      d. Abdominal segments 5-8 with conspicuous comb-like arrangement of spines along the posterior margins; head and prothorax yellowish to orange-yellow, abdomen brown..... *tricolor* Moulton.
      dd. Abdominal segments without combs; color brownish-yellow to yellowish white, abdomen not darker than head and thorax.
        e. Wings long surpassing tip of abdomen; head subglobose, vertex well rounded. *longipennis* Crawford.
        ee. Wings rather short, membrane not attaining tip of abdomen; head subrectangular in outline, vertex produced a little between bases of antennae but not rounded. *monotropae* n. sp.
  bb. No prominent bristles on posterior angles of prothorax.
    c. Color almost uniformly brown.
      d. Body of female long and slender, prothorax but little wider than the head..... *grandioculus* Watson.
      dd. Body, especially the abdomen of female, wide and heavy, prothorax considerably wider than the head. *stanfordi* Moulton.
    cc. Body yellow, more or less shaded with brown.
      d. Abdomen at least partly yellow.
        e. Abdominal segments 1, 2 and 10 shaded with brown ..... *obscurus* (Mull.)
        ee. Abdominal segments 1, 2 and 7-10 brown. *bicolor* Morgan.
        eee. Abdominal segments 7-10 shading to pale brown, 10 dark at tip..... *dicolor* Hood.

dd. Abdomen uniform chestnut brown.

e. Antennal segment 3 longer and narrower than 1, 2, 4, or 5 and as long as 6.
cameroni (Bagnall).

ee. Antennal segment 3 shorter.
secticornis (Tryb.).

aa. Antennae 8-segmented; body very light yellow, heavily tinged with orange on thorax; ocelli pale and inconspicuous; antennae shading from brownish yellow at base to light brown.....*arizonensis* Morgan.

Thrips flavicauda n. sp.

General color yellow ocher (Ridgway's Color Standards, 1912). Head a little lighter, maize yellow; abdomen usually much darker (especially under reflected light) except the last three segments; legs almost uniformly massicot yellow (Ridgeway); antennal segment 1 concolorous with legs; 2, with the head, segments 3-7 dresden brown, ocellar crescents carmine, eyes dark red, by reflected light; the thorax tinged with dark brown and light brown hypodermal pigments in the pterothorax. In the abdomen there are about a dozen and in the thorax one or two large blotches of black hypodermal pigment, which show bright yellow under reflected light. Some specimens (probably teneral) are a uniform light yellow color.

Head 1.3 times as wide as long, widest midway between the eyes and the posterior border, constricted behind the bulging eyes, dorsal surface with distinct anastomosing lines, cheeks strongly arched, roughened with minute bristle-bearing protruberances. A curved row of 5 or 6 minute bristles behind each eye; the last and most conspicuous ones behind the posterior ocelli dark, the others colorless. One on each side of the posterior ocelli dark, the most conspicuous ones on the entire head. *Frontal margin nearly straight.*

Prothorax only a little longer than the head. The inner bristles on the posterior angles are two-thirds as long as the median length of the prothorax; the outer ones half as long; three pairs of weak bristles along the posterior margin.

Wings reaching abdominal segment 8 (sometimes only segment 6), width in middle about one fourteenth the length; light gray in apical .7, lighter towards the apex and base, except the scales; basal .3 nearly clear; veins darker. Costal margin with about 20 bristles, anterior vein with 9 or 10 of which 6 or 7 are in the basal third; posterior vein with 10 to 12 regularly spaced ones. Abdominal segment 10 sulcate above in apical third. Segments 8 to 10 and ovipositor abruptly much lighter than the preceding segments, usually bright yellow. Ventral and lateral surfaces of the abdomen are much lighter than the dorsal surface.

Measurements: Total body length about 1.25 mm. (± 25 mm.). Head, length 0.12 mm., width 0.156 mm.; prothorax, length 0.185 mm., width 0.21 mm.; mesothorax 0.25 mm.; abdomen, greatest width 0.27 mm. Antennae, total length 0.30 mm.

Segment	1	2	3	4	5	6	7	
Length	30	40.5	56.5	53	42	57.5	23	
Width	33.5	31	26	24	21.5	23	9	microns

Male. Similar to female but very much smaller.

Measurements of type.—Total body length 0.75 mm. Head, length 0.07 mm., width 0.089 mm.; mesothorax width 0.20 mm.; abdomen, greatest width 0.18 mm. Antennae, total length 0.18 mm. Segments: 15, 25, 31, 31, 20, 37, and 15 microns in length respectively. Described from over fifty females and two males collected by the writer and Mr. Tissot.

Close to *T. impar* Hood which also has the three terminal segments of the abdomen lighter in color than the remainder of the abdomen, but not nearly as marked as in this species. The two can be at once separated by a glance at the intermediate antennal segments which are much wider in proportion to their length than in *impar*. The color of the insect is much lighter.

Hood has recently (Ent. Americana Vol. VII, No. 4) described a species of *Thrips* from Indian Pipe from New York under the name of *T. monotropae*. The writer has taken a single specimen of apparently this species from Indian Pipe in extreme northeastern Georgia. It was not taken in Florida.

THE SCARABAEIDAE OF FLORIDA

By W. S. BLATCHLEY
Dunedin, Florida

The family Scarabæidae comprises one of the largest and most important groups of the Coleoptera of the World. About 14,000 species, varying greatly in form, size and general appearance, are known. Their main distribution is in the tropics where some of the species are among the largest and most bizarre of known insects. Leng in his Catalogue lists 996 species from America north of Mexico, and perhaps 50 others have since been described from that area. These range in size from the pygmy *Pleurophorus parvulus* Chev., less than one tenth of an inch in length, up to the giant unicorn beetle, *Dynastes tityus* (Linn.), almost two inches long and of corresponding bulk, both of which occur in Florida.

The name of the family is derived from the Latin *Scarabaeus* or Scarab, meaning "a beetle." The Scarab of the ancient Egyptians was a sacred beetle belonging to this family, which they held in high veneration. It is stated that the dwellers in the valley of the Nile thought that the actions of these insects, when rolling their balls of dung, were typical of the planetary and Lunar revolutions; and that the sudden appearance of the beetles after a period of complete absence was emblematic of a future life. Hence they carved its image out of stone and

placed it in the tombs with their dead, and its picture was often painted on their stone coffins or sarcophagi.

The Scarabæidae, together with two other families, the Lucanidae and Passalidae, make up one of the great divisions or series of Coleoptera known as the Lamellicornia or Superfamily Scarabæoidea, so called because they alone have the antennal club composed of three or more elongate, leaf-like movable plates or laminae, so formed that in repose they fit so closely together as to have the appearance of being but one piece. In addition to this peculiar club the Scarabæidae have the body usually short, convex and robust; antennae 7- to 11-jointed, usually 10-jointed, and inserted before the eyes under the sides of the front; front tibiae always fossorial or fitted for digging, being broad, compressed, with the outer edge strongly toothed or scalloped; middle and hind tarsi long, always 5-jointed; pygidium or last dorsal segment usually exposed beyond and below the tips of elytra; visible ventral segments usually six, the last two or three in the male often flattened, impressed or otherwise modified.

According to habits the adults of the Scarabæidae are separated into two well marked groups known as the "dung beetles" or "scavengers" and the "leaf chafers." The former have the legs stout, the hind ones widely separated and set far back behind the middle of the body. They live upon putrefying or decomposing matter such as the dung of animals, decaying fungi and carrion. Of this group the common tumble-bugs and the skin beetles *(Trox)* are familiar examples. In the leaf-chafers the legs are more slender and the hind ones are attached at or before the middle of the body. They are much the more numerous and feed upon the leaves, or the pollen and petals, of plants, the May-beetles and "rose bugs" being familiar forms.

The larvae or grubs of the Scarabæidae are either white or yellowish in hue and have a brown horny head with prominent mandibles. In their later stages they are usually stout of body with the hinder end larger and much wrinkled. When at rest they lie partly coiled up, the tip of the abdomen almost reaching the long spiny legs. They live in the ground, where they feed upon roots, or in decaying wood or excrement.

The main object of the present paper is to list in natural order the species of Scarabæidae which are at present known from, or in the past have been recorded from, Florida, and to

show approximately their distribution in the State. Within recent years the changes wrought in the natural surroundings of many localities of the State have been very great. These changes have brought a corresponding one in the native fauna and flora of these localities. Many indigenous species have disappeared and new ones have been introduced. To put on permanent record for future use our knowledge of this important family of beetles as at present found in the State is, therefore, the principal reason for the preparation of this list. As no monograph of the Scarabæidae of North America has ever been published, and as the descriptions of the 200 or more species occurring in Florida are widely scattered, I have thought best to include a key to subfamilies and tribes, and a brief diagnosis of each genus and species, thus forming a means by which the future student can name the majority of species which he may have at hand.

(To be continued)

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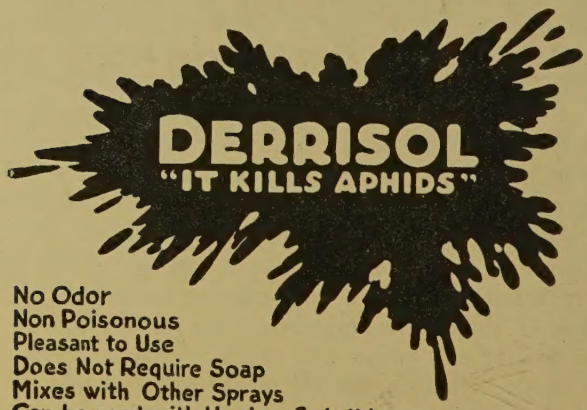

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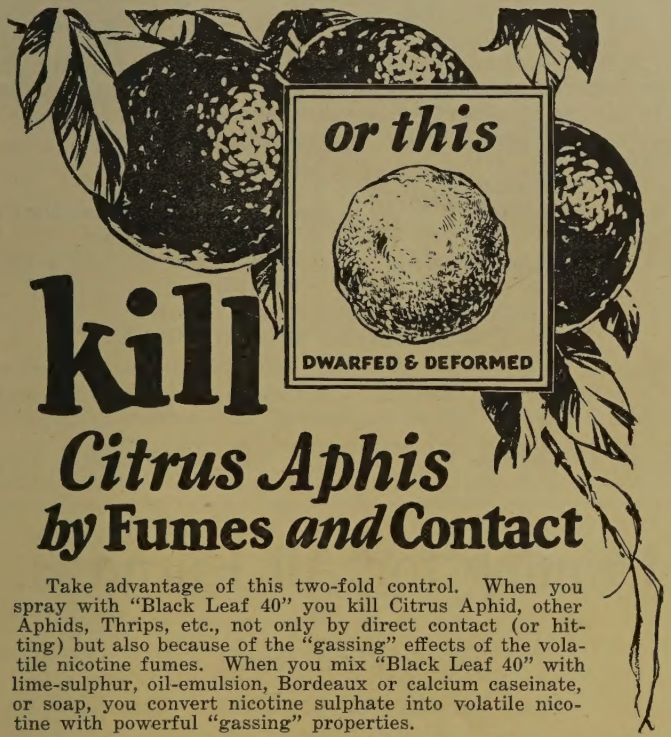

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